CLAIMS

What is claimed is:

1. A surface micromachining process for the fabrication of three-dimensional micro-hinges directly on silicon on insulator wafers comprising the steps of:

(a) defining openings around the surface of a desired hinge pin in a single layer of a silicon single crystal;

(b) subjecting the openings to an etching process for removal of oxide material that is located in contiguous relation to the openings under the area designated for a hinge;

(c) growing thermal oxide to define a gap between a hinge pin and a subsequently deposited polysilicon cap;

(d) depositing polysilicon and etching to define a hinge cap/staple; and

(e) wet etching to remove grown oxide and allow a pin to rotate inside the cap/staple.

2. A surface micromachining process as in claim 1 wherein after step (c), immediately depositing a thin layer of a chemical vapor deposited oxide sufficient to cover fine gaps not completely covered by said thermal oxide.

3. A surface micromachining process as in claim 1 further comprising the step of lifting a connected mirror structure out of the silicon wafer.

4. A surface micromachining process as in claim 1 wherein said etching processes are dry etching processes.

5. A surface micromachining process as in claim 1 wherein said silicon single crystal layer is from about one to about five microns thick.

6. A three-dimensional micro hinge formed by the process steps (a) through (e) as defined in claim 1.